

# CHAMBERS'S JOURNAL OF POPULAR LITERATURE

Science and Arts.

CONDUCTED BY WILLIAM AND ROBERT CHAMBERS.

No. 376.

SATURDAY, MARCH 16, 1861.

PRICE 1½d.

## BUY PRETTY POLLY!

Do you know the great Liverpool thoroughfares; those roaring streets with their endless processions of reeling, rocking, rolling wagons, piled high and heavy as if with the wealth of half a world? Do you know their pavements, down which the tide of life flows so strangely mingled; where men of all nations meet face to face; where the returned convict jostles the merchant-prince, and tawdriness and rags flutter with the gay dress of the merchant's wife and daughters? Will the women of the wealthy classes in our overgrown manufacturing towns ever find out, by the by, how much better a simple style of dress, and sober colours, would suit dingy streets and tall chimneys? At present, it seems to be the rule, that the more smoky a town, the more conspicuous the ladies will make their outdoor toilet.

These remarks Mrs B. and I were exchanging, *sotto voce*, in respect of a bevy of fair Lancastrians in showy dresses, pink bonnets, and light gloves, who, like ourselves, were waiting at the top of one of the principal streets in Liverpool for the chance of a safe crossing, when the request which heads this paper—Buy Pretty Polly!—screamed out close behind us, put an end to our criticisms. It came from the beak of a gray parrot in a cage over a shop-door—much like a little old man with a whitish head and a gray satin doublet, and just reminded my wife that she had always wished for a parrot—that I had promised to buy one, which I didn't at all remember—that there wasn't a better place for the purchase than Liverpool, and weren't we leaving to-day, and might never be there again—facts not in my power to gainsay; so the upshot was, that we found ourselves in the shop the next minute. The place looked more like a warehouse than a shop; it was lined with cages from the ceiling to the floor—a complete Noah's ark of feathered fowl. Nobody seemed to be guarding them, and for some minutes we stood watching the caged crowd within, screeching, whistling, fluttering, singing, in curious contrast, and yet not without a certain likeness to the perambulating crowd without. Here, too, was a babel of notes and voices; here was the strut, the swagger; here were beaks like hooked noses, both owned by birds of prey; hard, cruel eyes—eyes vindictive, melancholy, bright, restless, treacherous, suspicious, shy. Furry owls blinked out from one corner with the air of well-to-do fathers of families; and you might have sworn the monkeys, peering through their cages on the ground, were own cousins to the street-boys.

Some had ragged suits—fowls roughly used by

the world; others were respectable black, brown, gray, like their fellow-creatures without; and how that scarlet macaw, and those lories, put to shame the finest feathers of the finest birds outside! The longer I looked at the feathered people round me, the stronger the likeness grew to my own species; and I don't know what point it would have reached, if the master of the shop had not started up from somewhere—a little dry old man, with a bright eye and fluffy yellow hair, standing nearly upright, own brother he looked to the cockatoo winking on its perch behind him. Our negotiations, which had to be carried on at the extreme top of our voices, and eked out by dumb show, so deafening was the din about us, ended in the old man offering me my choice among fifty young parrots for a sovereign. I picked out the youngest of them, a shy, quiet bird, not fully fledged, and about six months old. Just as the old man was putting it into the travelling-cage, I said in a tone meant to be highly impressive: 'Now, mind, you warrant that bird free from all defects; and if he dies as soon as we get him home, I shall look to you to make it good.'

'I dunno about that,' replied the seller, eyeing me over his shoulder more like a cockatoo than ever. 'Ye look healthy, and like to live, both of ye, and so does Polly; but ye may be gone to-morrow, and so may she. We mun all go, men and birds. Na, I don't promise to make her good.'

What could mortal man find to say against this rejoinder? not made impertinently or doggedly, but simply, as if it were the most natural thing to say. I retreated somewhat discomfited, and felt more than usually disposed to buy insurance-tickets when we got to the Lime Street Station that morning.

I had sundry good reasons for not choosing our acquaintance at the shop-door: first, in consideration of many accomplishments, his price was five pounds; second, I had a curiosity to watch a young bird grow up to full-grown parrot's estate under my own eye; and lastly, that highly educated fowl might very likely have some words in his vocabulary which Mrs B. would not like to listen to. That such things have been, we could both bear witness. Though the thing took place years ago, yet could anybody who was present at that confirmation-luncheon at Waterwold vicarage, forget what happened then? Our vicar, the Rev. Arthur Simpson, had not long been transferred from a curacy to Waterwold, and his wife who, with a large family and small means, had not often played the hostess, felt this entertainment, to which a number of guests were to be asked to meet the bishop, a very nervous affair. In her perplexity, Mrs Simpson consulted Mrs

B., who prides herself on being *au fait* in such important matters. Ye gods! what solemn discussions went on between those two ladies about the game, and the fowls, and the waiting, and the creams, for a week beforehand. I knew every dish, and could have mapped the whole table out on paper. By dint of hearing so much about the luncheon, I naturally came to take a deep interest in its success, so that when on the great day we were ushered into the vicarage dining-room, I was, as Mr Pepys says, 'mighty pleased that the table did look so handsome,' and shared my wife's satisfaction on observing that the great jelly-lion—for a long time a refractory beast, bent upon coming out of its mould minus its head—had been melted down into submission, and shook the terrors of its mane, every hair complete, in full view of the bishop. He was a grave but genial man. The party proved particularly pleasant; and poor Mrs Simpson, towards the middle of the luncheon, found leisure to think how well it was going off, when his lordship took notice of a parrot which, swinging in his cage suspended from a hook in the ceiling by the window, looked down on us all with a sort of vindictive surprise.

'You have a fine bird there, Mr Simpson,' said the prelate; 'I keep one myself at Fulford. Does yours talk much?'

'No, my lord. I've taught him every day myself for the three weeks I've had him, but he won't say anything.'

'Indeed!' (The bishop looked benignly at the bird through his spectacles.) 'Why, Coco, can't you talk? Haven't you anything to say to me, Coco?'

At the sound of 'Coco,' his own name, which he had not heard at the vicarage, the bird set up all his feathers; perhaps he was excited, too, by the sight of so much company and good cheer; perhaps he felt bound to answer when addressed by a bishop. Opening his beak with a scream which made everybody jump, he burst into the heartiest commination service a bishop ever had the luck to listen to. You may imagine, though I can't describe, the commotion. The ladies held their ears, the best thing they could do; the servants could not reach the cage to get it down; and how that bird went on while the steps were being brought, and our host, very red and nervous, unhooked and hustled him out of the room at last! The vicar came back in a minute or two, with his finger and thumb bitten, I believe in an attempt to wring the creature's neck. Nothing short of such a measure could have stopped the bird, and this had not succeeded, for all the rest of the luncheon, though everybody tried hard to seem as if they didn't hear it, there was a perpetual grinding growl, the exact voice of the Irish sailor, Coco's previous owner, issuing from the dark closet under the stairs, to which he had been consigned. Of course, we all felt what very naughty words the bird was saying, and the conversation flagged forthwith; somehow, it wasn't easy to keep up church-talk, and school-talk, and religious societies' talk with the accompaniment of a swearing parrot in the background. After such an experience, you may suppose I should avoid the purchase of a bird which might, like Coco, talk 'not wisely, but too well.'

For those who have any curiosity in observing the steps by which an animal grows perfect in its little round of experiences and actions, a young parrot is a most interesting study. A bird of six months is a quiet little thing, two-thirds of its full size, sitting stupidly on its perch all day long. Besides getting its full feathers, and growing a fine red tail, it has to accomplish a great deal in the way of education. Of course, in the case of a solitary individual, where instinct is not helped on by the imitative faculty, the process is much more slow and difficult. Its natural note—not a pleasant one, half plaint and half chirp—has to be changed through the range of inarticulate

sounds from the first faint gabble up to perfect human speech. That its beak is an anchor, a lever, and a means of transport, as well as of mastication, the creature has yet to find out; and it must learn this before it can perform its monkey feats of climbing,\* swinging, and suspending itself head downwards, precisely like a bird hanging in a larder. And, finally, it has to arrive at the knowledge which seems to come last of all—that his claw is a prehensile organ.

Have parrots any notion of the sense of words? A question which has been often mooted, and most writers, with Pope at their head, give a verdict against the bird's intelligence. To some extent, they do know what they say; attaching, like cats and dogs, certain meanings to certain sounds. My parrot, for instance, knows his own name—Coco; and that the words 'Pussy,' 'Scamp,' represent the cat and dog, the meaning of some words of praise and blame. He gives their respective names also to inmates of the house. He goes a step beyond even, for when a pet-robin walks in at the window for his daily dole, Coco calls out patronisingly: 'Pretty bird—pretty little bird!' and addresses the house-cannary in the same way. Here he shews a power of generalisation; he has an idea that a creature with beak and feathers is a bird like himself. 'Kiss Coco,' and 'Coco pecks,' are also phrases understood, for he suits the action to the word. When he calls for food, he calls intelligently; and if shewn apples, nuts, &c., of which he is fond—the name at the same time being repeated, he soon picks up the word, and attaches it to the object. It is plain, therefore, that the bird is more or less intelligent in respect of words which represent an object or action perfectly familiar to him; beyond this, his speech becomes mere imitation of sound. A very sagacious parrot of my acquaintance offers a good example. Its master will peep into the room where Polly is, who calls out instantaneously: 'Ah, there you are, Mr Clarke!' If another gentleman looks in the same way through the half-open door, Polly cries: 'Ah, there you are, Mr——,' and always stops—it knows the name is not 'Clarke.' But this same Polly was the property of a sailor, who must have been a bit of a coward in a stiff nor'-wester; and when the wind blows hard, the bird will cry by the hour together in the most distressed and supplicatory tones: 'Lord have mercy on Bob Barnard!' attaching, of course, just as little meaning to its words as one of its kind in Antwerp, which repeats the Paternoster and Ave Maria exactly as if it were saying a rosary—a pious accomplishment it acquired from being, like the famous Vert-vert, pet-parrot to a convent.

The facility with which my pretty Polly picks up inarticulate sounds is really astonishing. Distant street-cries, conversations with great variety of voice and tone, yet without any articulate utterance, the creaking of a gate, the rolling gravel with a garden-roller, running-water, coughing, sneezing, &c.—all these, and many others, will be faithfully given by our bird-ventriloquist, and the more discordant, the better they seem to please it. If the reader is an F.R.S., the name of my friend Caleb Farnett, and his learned treatise on *Methylethylamrylophenylammonium*, will be familiar to him; if he is not, and ignorantly supposes this little word to be coined out of Polly's inarticulate sounds, I beg to refer him to *Philosophical Transactions*, 1851, p. 380. Farnett lives principally at Waterlool, for the sake of the quiet, he says, in a small house, and mostly shut up in a small study; a pale-faced, nervous bachelor, who makes his house-keeper go about in list-shoes, and would make the cat do so also, had not nature, in consideration of Mr Farnett's nerves, given her a pair of velvet of her own. About a month back, as I was getting out of

\* Owing to the peculiar conformation of the genus *Psittacus*, they cannot climb by aid of the claws alone.

a railway-carriage at our little station, who should I see but Caleb Fornett getting into one! After we had shaken hands, he in the carriage, I standing on the platform, and he had told me that he was off to London for a fortnight, he exclaimed: 'Oh B, we've got a parrot, and Morris doesn't know how to feed it. She gave it some of her supper last night—bread and cheese and beer. Will you tell us what they ought to have?'

'Of course. But how came you by such a thing? Why, I should have thought you the last man in the world to buy a parrot.'

'I didn't buy him,' explained Fornett. 'The canary died on Tuesday; and when Mr Smith, of Yelverton, called that afternoon, he said he would send me a bird I should like instead. I was quite surprised when the parrot came in a great cage by the Yelverton carrier yesterday. Such a quiet bird, I think I shall like him. But what are you laughing at, B?'

'Laughing? Why, at the notion of a parrot supping off cheese and beer, to be sure. I'll look in, and tell the housekeeper what to give him. I hope he'll amuse you when you come back. Good-bye.'

Off went the train with a tremendous whistle, and off went my friend, holding his ears very hard. I finished my laugh as I walked up from the station. The idea of poor Fornett and his prize was really too ridiculous. I knew the bird well; the noisiest vixen that ever sat in a cage. The Smiths were blest with a large little family, and it had all the nursery uproar at its tongue's end. They found the bird intolerable at last, and had generously given it away half-a-dozen times; but it always came back, like a bad sovereign, to its owners.

That day-fortnight, when Caleb Fornett stood at the door of his house, he could scarcely believe it was his own. It might have been appropriated as a founding-hospital during his absence: out of every door and window, as if the little dwelling were bursting with sound, there poured volumes of nursery-cries, slaps, screams, scoldings, vociferations all in one breath. As the housekeeper answered the door, shrieks of 'Mamma, mamma!' rang through the passage. Had quiet bachelor ever such a welcome home before!

'Morris, what does this—this infernal clamour mean?' asked her master in a shaky voice, intended to be stern.

'Mean, sir!' shouted Morris, coming out that she might hear herself speak. 'Why, don't you know it's that bird of yours, sir? He's got the voices of all them little Miss and Master Smiths; and ever since Tuesday was a week, he begun, and has been going on like that. I'— Cough, cough, whoop, whoop, whoop, till the house rang again. 'There! now he's in the hooping-cough; the little Smiths had it in the autumn.'

'Good Heavens, what shall I do?' cried Caleb aghast.

'I know what I shall do, sir, now you're come back—I shall speak my mind, which is, that me or that bird packs off this very afternoon!'

I need not add that Fornett caught eagerly at the suggestion, and that the parrot went back, as he came, by the carrier that day.

Common report says that Polly, like the phoenix, sees out its century; but from fifty to eighty years is the term of its natural life. Le Vaillant, the celebrated naturalist, describes an octogenarian gray parrot he saw at Amsterdam; it was decrepit and doting like a very old man, had lost both sight and memory, and was kept alive with biscuit dipped in Madeira. After sixty, its memory began to fail, and it lost its words by degrees, returning to its native jackdaw note. At sixty-five, its moult became irregular; the tail feathers dwindled, and were replaced by dull yellow instead of red. After this

change, the bird never renewed its plumage. Three conditions are essential to Polly's health and comfort—warmth, proper food, and cleanliness. The diseases to which these birds, when in captivity, become subject, are brought upon them through ignorance or neglect, for when properly treated, they are perhaps the healthiest of all our feathered prisoners. How often a bird may be seen shivering at an open window, or out of doors, in a cold wind; and when he drops dead from his perch, or wastes away, nobody supposes his being set out in 'that beautiful sunshine' had anything to do with the misfortune.

Again, no creatures suffer more from improper diet. When you see a parrot sitting sullenly, its head drawn into its neck, the plumage dull and harsh-looking, you may be sure poor Polly is a martyr to dyspepsia, and feels quite as cross and no-howish as human bipeds do under similar torments. All birds in captivity should be fed as nearly as possible as they feed themselves in freedom. Now, the Psittacidae are strict vegetarians: young shoots, pulpy fruits, grain, and almonds, make up their bill of fare. To keep your bird in full health and beauty—which is the visible sign of health—you must confine him to bread soaked in water (no milk, remember), hemp-seed, or hemp and canary mixed; a bit of hard biscuit, or crust dried in the oven, is healthful; dates, nuts; in fact, any dry or ripe fresh fruit in moderation. He has Paddy's taste for a good boiled potato, which may be indulged. His favourite part of an apple is the core, from which he picks out the pips with evident relish, undaunted by Sir Fitzroy Kelly's opinion. For orange and lemon pips, also, he has a penchant, even for those of the Seville orange, which we might suppose too bitter for any living thing to eat. Never give your bird animal food in any form, and you will not find him suffer from dysentery, lose his feathers in patches, or pluck them out, as parrots often will, in the uneasiness produced by a vitiated state of the blood consequent on improper diet. The last point, and a very important one, is cleanliness. Both perch and cage must be duly attended to, or our favourite is apt to suffer from sore feet, or to be attacked by insects. A bath regularly given, daily in summer, twice a week in winter, with the chill just off the water, adds much to his comfort and appearance. They don't like it at first, but they soon enjoy the fun of being well splashed, and are always noisier after it. These rules, which were given me by a dealer in foreign birds in Paris, who has long been noted for the health and beauty of his parrots, apply to cockatoos, macaws, lorries, and all birds of this genus. When carefully kept, the gray parrot (*Psitt. cinereus*) might be reckoned a beautiful creature even without the embellishment of his bright pomegranate tail. The feathers, which lie lightly, yet firmly, over each other, their edges forming deeper and lighter undulations of tint, have a smooth, satiny lustre; and an efflorescence like fine white powder, perpetually renewed, is to his plumage much what its bloom is to the plum. Have you ever lifted the ear-coverts, to look at the large curious ear, and observed how different from the close, short, round feathers which thatch the head are these?—long slender plumes they shew through a magnifying-glass—slightly curved over the opening, so as to protect it without intercepting sound. There are two varieties of the ash-coloured parrot—one with a dash of red on each wing (*Psitt. G. alis rubris*), and another (*Psitt. G. rubro varius*), the gray groundwork of whose plumage is varied all over with red.

The ash-coloured parrot was not known in Europe until some time after the discovery of the Cape by Vasco da Gama, 1496. It is common in most African regions, lives in large communities, but keeps in pairs. The thought comes strangely enough, that 'the cock-comb bird, so talkative and grave,' sitting demurely at our fireside, has looked down from a far different perch



on herds of buffaloes and elephants, and seen troops of scared antelopes flying from the lion. Ah, Polly, you would talk to some purpose if you could tell us the wonders of your home in the primeval forests of South Africa, of the giant evergreen trees, thick interlaced with gorgeous creepers, and the jungle beneath, a wilderness of glowing blossoms! Perhaps in the forests which climb half-way up the skirts of the Zeireberg, has Pretty Polly chattered and swung with thousands of companions, while the morning shadows lay black in the ravines, and the mists rolled, purple, amber, and gray, down the mountain-heights as the sun struck the topmost crags with flame, and the great diapason of the forest, from all its myriad forms of life, upswelled to greet him! What comfort can these children of the sun take from the sight of our trim gardens, and our pale summer sunshine? We have freed the black population of Africa—why shouldn't some zealous philanthropist, in want of what he calls 'a cause to advocate,' take up that of her gray forest-people, kept slaves to our pleasure in a solitary dwindled-down existence? Let us hear what the bird himself, as the party most concerned, has to say on this matter. Coco, swinging away as if there was nothing else to be done in the world, opens his beak: 'What have you got for Coco? Coco is going to be married to the cat. Ha, ha, ha!' Decidedly, we need waste no pity on our little gray friend; like a true philosopher, he doesn't trouble his head about the past, but looks out for his advantage in the present, and amuses himself with plans for the future.

#### THE COAL-FIELDS OF GREAT BRITAIN.\*

'How long will our coal-fields last?' is a question of great importance, especially in connection with whatever may serve greatly to increase the consumption of coal. It is necessary we should be put in possession of such facts as may enable us at least to approximate to a correct notion on the subject, and the valuable work of Mr Hull is in this respect of much service; he has had large means of information at his disposal, and he has made good use of them.

It is difficult to ascertain much concerning the earliest attempts at coal-mining, which must have been of a very humble nature, and regarded for long as unworthy a place in the chronicles of history; and even when at last they obtain any mention, the notices are of a very scanty nature. The coal spoken of in Scripture is no doubt charcoal, for coal is not to be found in the Holy Land or Arabia, and none nearer than the shores of the Black Sea and the Bosphorus. Theophrastus, a Greek, who wrote about 238 years before Christ, briefly speaks of the nature of coal, and tells us how it was used by smiths in his day: he says it was found in Liguria, and in Elis on the road to Olympias over the mountains. In our own island, so especially abounding in coal strata, there can be no doubt that at a very early period coal had begun to be used. A flint axe, stuck into a bed of coal, was lately discovered in Monmouthshire; and when we remember that flint weapons denote the earliest stage of civilisation, in which neither iron nor even bronze implements were made, we may infer the early age at which coal was turned to account. A few years since, some miners, near Stanley in Derbyshire, while engaged in driving a heading through the

Rilburn coal, broke into some very old excavations, in which they found axes or picks formed of solid oak. Implements which appear to have belonged to an equally early period, are stated, to have been found in old coal-workings near Ashby-de-la-Zouch, consisting of stone hammer-heads, wedges of flint, and wheels of solid wood. We have, therefore, sufficient evidence that our coal-mines were worked to some extent long before the invasion of the Romans. After this period, no doubt coal would be more frequently used, for the Romans had many stations close to the outcrop of valuable coal-seams, and cinders have been found amongst the ruins of Roman towns and villas. In his history of Manchester, Whittaker tells us that at Castle Field, among other Roman remains turned up about a century ago, cinders and scorie were discovered in several places, as well as the actual refuse of some considerable coal-fire. He also relates that, in the West Riding of Yorkshire, near North Brierley, a quantity of Roman coins, the very best indices of dates, were found carefully repositied amid many beds of coal-cinders heaped up in the adjacent fields.

After the time of the Romans, and when we enter upon the Anglo-Saxon period, traces of the clearest kind may be gleaned from documentary evidence. In the Saxon chronicle of the Abbey of Peterborough, dated 852 A.D., we read that the Abbot Ceolred let to hand the land of Sempingham to Wulfred, who was to send each year to the monastery, among other things that are specified, sixty loads of wood, twelve loads of coal, and six loads of peat. It is certain, therefore, that at this early period coal was becoming an article of household consumption. The fact should be noticed also, that the word *coal* is of Saxon origin, and must at this time have become nationalised, for it to take so deep and firm a hold in the language of the country. We see no mention of coal in the *Domesday-Book* of William the Conqueror; but this is not surprising, since mineral productions of every kind are left unnoticed, and the commissioners evidently confined their investigations to the extent, rights, and ownership of the surface-land, together with the classification of the inhabitants. But in the *Boldon Book*, published in the reign of Henry II., containing the census of portions of the northern counties, we find references to coal in connection with smiths' work. In the year 1259, Henry III. granted a charter to the freemen of Newcastle-on-Tyne for liberty to dig coal; and under the term *sea-coal*, a considerable export trade was established with London, where it speedily became an article of consumption, especially amongst the various manufacturers. At first, much prejudice arose against the use of coal, on the ground that its smoke contaminated the atmosphere, and injured the public health; and in 1306, the outcry became so general, that the Lords and Commons presented a petition to King Edward I., who issued a proclamation forbidding the use of coal, and authorising the destruction of all furnaces and kilns in which it was burned. The proclamation was afterwards repealed, and we may notice how, in the face of opposition, there was a steady increase in the consumption of coal. Historical records are still extant recording the opening of collieries during the fourteenth century in various parts of Yorkshire, Durham, and Northumberland. Campbell, in his *Political Survey of Britain*, published in 1774, states that although coal was employed in manufactures for several hundred years, it did not come into general use till the reign of Charles I., and was then sold for seventeen shillings a chaldron. In 1670, about 200,000 chaldrons, in 1690, upwards of 300,000, and in 1760, double that quantity, were annually consumed in Britain. From that time to the present, the consumption of coal has gone on steadily

\* *The Coal-fields of Great Britain: their History, Structure, and Duration, with Notices of the Coal-fields of other Parts of the World.* By Edward Hull, B.A., of the Geological Survey of Great Britain, and Fellow of the Geological Society. E. Stanford, Charing Cross, London.

increasing, so that the average quantity of coal raised annually in Great Britain at present is about sixty millions of tons.

Considering how much the manufactures and prosperity of England depend on the still continued supply of coal to at least its present extent, a knowledge of our resources in this respect, based upon calculations worked out with the utmost care, becomes of the utmost importance; and hence the value of Mr Hull's present volume. The consumption of coal in our country is at least three times greater than the combined produce of all the remaining coal-fields in the world. But the supply cannot be unlimited, and hence we shall do well to endeavour to ascertain what are our probable resources.

Just at this point, geology comes to our aid in enabling us to make surveys both comprehensive and to be relied upon. As if with full foresight of the future use of coal, a provision was made by the Creator on such a stupendous scale as should for thousands of years supply the whole world with fuel. For countless ages was the earth covered with gigantic trees, and a thick undergrowth of plants from pole to pole. Forests of huge pines, tree-ferns, reed-like calamites, sculptured sigillaria, and the hirsute lepidodendron, were everywhere to be seen, while a rank and luxuriant herbage cumbered the swamps below. At that time, no arctic regions, bound with ice and snow, checked the growth of vegetation, and limited its advance, but one uniform climate of fostering heat, with abundant moisture, prevailed over the whole globe. This is inferred from the vegetation of the coal period, displaying as it does the same genera, and most of the same species, throughout the whole of Europe and of North America, from the arctic regions as far south as the thirtieth parallel of north latitude. Also, this uniformity of vegetation is continued vertically, the same species ranging throughout the whole series of strata, amounting in some instances to a thickness of 10,000 feet, shewing that a similar uniform climate prevailed over the whole globe for a long succession of ages.

It was the observation of Sir William Logan twenty years ago, and since abundantly confirmed, that every coal-seam lies on a bed of clay. These under-clays, which formed the soil on which the coal-forming plants grew, are distinctly stratified, shewing that they have been deposited under water; and all recent investigations strengthen the probability that this water was not fresh, but marine. It is not unlikely that the coal-plants were fitted to grow either partially submerged or at the sea-level. The great swamps at the estuary of the Mississippi, along the coasts of Louisiana, and the tropical lagoons of the African coast, though not strictly analogous, furnish us with the nearest representation of the nature of those forests that have produced our coal-beds. The strata associated with coal consist of sandstones and shales. The sandstones, which were once sand, are frequently rippled, and contain fragments of drifted plants; the shales have generally been deposited tranquilly, and are sometimes so highly carbonaceous as to be nearly black, forming impure coal called *basse*. We may comprehend the formation of a bed of coal by supposing a low-lying tract, subject to inundations from the sea, thickly covered with trees, plants, and herbage. After a time, a slow subsidence of this tract takes place, and then the brackish waters of the estuary, and the salt waters from the ocean, carrying dark mud in suspension, gradually submerge the whole. The deposit increases until it covers in one uniform sheet the accumulated growth of centuries. After the subsidence has ceased, and the soil increased to a sufficient elevation, a fresh growth of vegetation takes place, and is continued for a long period of years. Generations of trees, ferns, and grasses spring up and die, till the pulpy mass attains a thickness of 20, 50, or 100 feet. Another subsidence takes place as before, and

the whole bed of vegetable matter is subject to chemical and mechanical forces, till what was once a forest becomes eventually a mass of coal. By a repetition of this process, coal-seams are formed one above another—in some cases, above fifty in number—comprising a vertical thickness of several thousand feet of shales, clays, and sandstones. Ages roll on; the strata are moved from their foundations: upheaved from the sea-bottom, the breakers and currents sweep away a portion of the covering, and the mineral treasures are brought within the reach of mining industry.

The coal-field of South Wales is the largest in England, and, with the exception of that of Nova Scotia, contains a greater vertical thickness of strata than any coal-field in the world, amounting to upwards of ten thousand feet. It is separated by Caermarthen Bay into two unequal portions: the larger portion, that to the east, stretching to Pontypool, a distance of fifty-six miles; the smaller, to the west, extending seventeen miles to St Bride's Bay—the greatest transverse diameter, at Neath, being sixteen miles. The average annual produce is about eight millions of tons, and at this rate the supply will last two thousand years.

The extreme length of the Bristol and Somersetshire coal-field—from its northern apex, at Cromhall, to the northern flanks of the Mendip Hills—is about twenty-five miles. In this coal-field, the strata among the hills are much disturbed; and those along the northern borders plunge so rapidly towards the centre of the basin, that many of the coal-seams are buried to the depth of four or five thousand feet beneath Pennant grit: hence much of the coal is not available. The annual produce of this field is about six hundred thousand tons, and at this rate would not be exhausted under three thousand years.

The Forest of Dean coal-field, Gloucestershire, forms a more perfect basin than any other coal-field in England, as, with a slight exception, the strata everywhere dip from the margin towards the centre. Its area is about thirty-four miles. The coal is being gradually worked from the margin of the basin where it crops out, towards the centre, where it is deep. At the present rate of annual production, five hundred thousand tons, the yield will last above a thousand years.

The coal-field of Colebrook-dale, Shropshire, has a triangular form, its base being in the valley of the Severn, and its northern apex at Newport. Over a very large portion of this field, the coal has been nearly exhausted, as may be seen from the Wolverhampton and Shrewsbury Railway, where, for a long distance, dismantled engine-houses meet the eye, and enormous piles of refuse from abandoned coal and iron mines may be seen. At the present rate of consumption, this coal-field will be exhausted in about twenty years.

The Denbighshire coal-field, beginning about three miles south of Oswestry, extends northward, about eighteen miles in length, and four in breadth at Wrexham. The yearly production is now above five hundred thousand tons, and at this rate it would last nearly a thousand years. But as collieries are now being erected along the Chester Railway, the production will probably be doubled.

The Flintshire coal-field extends along the western side of the estuary of the Dee to Point of Ayr, a distance of fifteen miles. Throughout a considerable part of its range the productive portion is very narrow, and greatly broken by faults. As the greater part of the coal lies near the surface, it has been so much exhausted that probably not more than one-half remains for future use, and therefore the supply will scarcely extend to fifty years.

The South Staffordshire coal-field extends from the Clent Hills on the south to Brereton, near Rugeley, on the north, a distance of twenty-one miles, and is of an average breadth of seven miles. The proximity to Birmingham, Dudley, and Wolverhampton has brought its resources into full play. From Dudley Castle, the centre of the coal-field, the country in every direction,

for five or six miles, is overspread by collieries, iron-foundries, and blast-furnaces. About five million tons of coal were raised from this field in 1858, and at this rate it may be exhausted in about two hundred years.

The North Staffordshire coal-field, though of smaller area than that of South Staffordshire, has vastly greater capabilities, with twice the thickness of workable coal. This field is a triangle, with its apex to the north, at the base of Congleton Edge; the eastern side is formed of millstone grit, and the westerly of New Red Sandstone or Permian strata, close to the Potteries. In 1857, it yielded 1,295,000 tons of coal, and will not be exhausted for twelve hundred and seventy years.

The great coal-field of Lancashire is very irregular in outline, and consequently difficult to describe. Its extreme length from Bickerstaffe to Staley Bridge is thirty-two miles, and its average breadth six miles. Smaller isolated coal-fields occur at Croxtette Park, Manchester, and Burnley. Calculating the annual production at nine millions of tons, there is sufficient coal to last for four hundred and forty-five years.

The length of the Cumberland coal-field is about twenty miles, and its greatest width at Workington about five miles. Between Maryport on the north, and St Bee's Head on the south, it stretches along the coast of the Irish Sea, and extends inward for a distance of five miles, in which direction the beds rise and crop out. At the rate of a million of tons a year, the coal will last for about a hundred years.

The Warwickshire coal-field is small but rich, extending from near Tamworth in a constantly narrowing band, by Atherston and Nuneaton, to near Wyken, a distance of fifteen miles. At the present rate of consumption, three hundred and thirty-five thousand tons, it will last for twelve hundred and forty-four years.

The Leicestershire coal-field, inextensive but valuable, occupies an irregularly shaped district south of the Valley of the Trent. In the main coal-field of Moira, at a depth of 593 feet, salt water, beautifully clear, trickles down from the fissures where the coal is being extracted. The present yield of coal is six hundred and ninety-nine thousand tons, and, at the same rate, will last about two hundred and fifteen years.

The Derbyshire and Yorkshire coal-field underlies, in part, the counties of Derby, Nottingham, and York, and is the largest coal-field in England. Twelve and a half millions of tons were extracted from it in 1857, and, at the same rate, it will last for more than seven hundred years.

The great northern coal-field of Durham and Northumberland extends from Staindrop, near the north bank of the Tees, on the south, to the mouth of the Coquet, where it enters Alnmouth Bay on the north, the distance being nearly fifty miles. Its greatest diameter is near the centre, along the course of the Tyne, which forms the great highway for the export of coal to the London market. The North Sea from the Coquet to the Tyne forms on that side the limits of the coal-field. Its annual yield is about sixteen millions of tons, and it will last, at this rate, for four hundred and sixty-six years.

The great coal-field of Scotland forms one of the geological bands crossing the country from south-west to north-east, and stretches from Kirkcudbrightshire to Berwick. The extreme length from the coast of Ayr to Fife-ness is ninety-four miles; the average breadth, twenty-five miles. The quantity of coal raised in Scotland is about nine millions of tons, and some of it exceedingly valuable for gas.

There are geological grounds for believing, that two-thirds of Ireland was once covered by coal-beds; but the carboniferous limestone, which in other countries is uniformly surmounted by coal-measures, has at some remote period been swept clear of them in Ireland, with the exception of a few isolated tracts

in Kerry, Cork, and Waterford, and at Tyrone, Ballycastle, and some few other places in the north.

The extent of the coal-bearing strata in our Indian empire is large, though not very productive, while the coal is of inferior quality. There is coal in Australia; but in New Zealand the coal strata are exceedingly valuable. While there is much coal in the United States, there is none whatever in Canada. The coal-fields of British North America are at Newfoundland, Cape Breton, and Nova Scotia. The coal-field of Cape Breton contains erect stems of fossil-trees, and gives evidence of at least fifty-nine forests buried in succession. Some of the beds shew casts of rain-prints, worm-tracks, sun-cracks, and ripple-marks.

In the foregoing calculations as to available coal in this country, Mr Hull has excluded what lies beyond 4000 feet from the surface, and for this he gives important reasons. The lower we descend, the more we have to contend with increased temperature and pressure. Arago, after actual experiment, gives us the following results: In an artesian well at Paris, there was found an increase of one degree for every sixty feet of depth; at Saltawerk, in Westphalia, it was one degree for every fifty-four feet; near Geneva, it was one degree for every fifty-five feet; and at Mondorff, in the grand duchy of Luxemburg, it was one degree for every fifty-seven feet. According to the *Encyclopædia Britannica* (Art. 'Mines and Mining'), in the Treasavean mine, Cornwall, the temperature at the depth of 2112 feet ranges between 90 and 100 degrees Fahrenheit; and some of the water from the deep levels of the united mines stands at 106 to 108 degrees Fahrenheit, which would give an increase of one degree for every fifty-six and a half feet. The observations of Professor Phillips, at the Monkwearmouth Colliery, shew an increase of one degree for every sixty feet. According to thermometrical observations between 1848 and 1859, in the colliery at Dukinfield, Cheshire, it was found that, at the depth of seventeen feet, 51 degrees Fahrenheit is the invariable temperature throughout the year; also, that there is an increase of one degree for every eighty-three feet of depth in that mine. Perhaps some peculiarities of strata may account for this unusually slow increase of temperature. Striking an average between the two extremes afforded us by the experiments above noticed, we get an increase of one degree for about every seventy feet, which will generally be correct. Now, since it has been found that at a depth varying from fifteen to fifty feet, the temperature remains the same all the year round—that is, about the mean annual temperature of the air—we may adopt 50 degrees Fahrenheit as the average standard of departure from that depth. Calculating the increased density of the air at one degree for every 300 feet of depth, and combining this with the increase of temperature, we find that at 2500 feet the temperature is 94 degrees Fahrenheit, or almost that of the tropics; while at the depth of 4000 feet the temperature will be 120 degrees Fahrenheit. Now, against this some allowance must be made for the effect produced by a good system of ventilation. By this means, it was found that in the Shireoak Colliery, at the depth of 1530 feet, the temperature could be lowered 10 degrees. Also, it is not unlikely that in winter, and during severe frosts, the temperature may be reduced still further. But Mr Hull considers that, in the face of the two obstacles, increasing pressure and temperature, it would be impossible to work coal-mines at a greater depth than 4000 feet. The following is a recapitulation of the results to which he has arrived: That there are coal-deposits in England and Wales at all depths to 10,000 feet; that mining is possible to a depth of 4000 feet, because the temperature of 120 degrees Fahrenheit at that depth is capable of considerable reduction by means of ventilation; and that, adopting 4000 feet as the limit to



deep mining, there is still a sufficient stock of coal in England and Wales to supply for one thousand years sixty millions of tons annually, the present rate of production.

## THE FAMILY SCAPEGRACE

CHAPTER XII.—OUT OF TOWN.

AT seventeen, and with a five-pound note in one's pocket, who is there that needs 'to call the Lord Mayor his uncle?'—an expression, ladies, borrowed from the classics of the lower classes, and signifying, generally, the advantages of any high social connection. With elastic youth upon our side, and so much money as puts the immediate future out of base consideration, whom, indeed, need we envy? Not the hoary duke, whose span of existence even our five pounds, discreetly expended, may see the end of, and whose manner of life—if we may believe the popular novelist—has not been such as to afford him entire serenity in its contemplation. Nay, scarcely any old gentleman, we may say, in any however eminent social position, but would be glad to change places with us, and barter all his honours and riches for the privilege granted to Hezekiah of old. Remember *that*, O unfriended weary young tramp, plodding with scanty wallet upon Life's crowded highway, and may it be a comfort to your murmuring spirit! The third of those who recline in the splendid chariots whose wheels cover you with dust, are by no means to be envied; nay, not even he in the bishop's coach yonder, who has worn his purple and fine linen, and fared sumptuously every day, since that vicarious hour when he married the dangerous girl betrothed to his patron's heir, and left his own sorrowing Katie to wear the willow.

It is possible that poverty-stricken Youth does comfort itself in this fashion, and it is certainly observable that it does not promote or lead revolutions (as one might well expect it to do) in the same proportion as unprosperous Middleage—that period which despises both the hopes of the Young and the regrets of the Old, and estimates to an extreme degree mere loaves and fishes.

It was probably most excellent natural spirits, however, rather than the above reflections, which made Richard Arbour whistle and sing so blithely as he trod the leafy lanes of Devonshire, on the third day from that on which we parted from him at Kensington. He had during that interview in the arbour prepared Miss Lucy's mind for his immediate departure, setting forth the positive necessity of it so vividly, as to silence all her eloquent love-battery except a sigh or two. He did not confide to her the precise nature of the employment he had in view, nor was her trustful nature solicitous to discover what he whom she loved would fain conceal; nor did he reveal it more particularly to her brother, or to Maggie, with both of whom he communicated by letter, after he had left London. By letter, too, he had expressed his profound gratitude to Mr Mickleham, and the hopes which he entertained of getting an honest livelihood, and of not shaming his generous protector by any future conduct; and by letter he had informed Lucidora that her advice, in case of the worst, had been followed, and that he accepted her five pounds with the most heartfelt thanks, as a loan which he trusted would be but temporary.

Having thus performed his literary duties—which were always somewhat irksome to him—and set himself right with all his friends—which was a novel as well as satisfactory position to find himself in—Dick had travelled along merrily by coach and railway to within a little of the town of Salterleigh, in North Devon, which he was now approaching on foot. The noontide light fell green and golden through the shadowing branches that almost met above his head, and lit up the red sandstone banks that walled him in on either side. Walking amid a rainbow of colours that seemed rather to belong to air than earth, and conscious of the unseen summer influences in his heart and brain, it was no wonder that he thought of Darkendim Street, and its smell of mouldy straw, with a sort of pleasant scorn. There is no man so closely wedded to Town, but that on some days in every year he acknowledges to himself that his marriage was one of convenience, and that the Country is his true and natural consort, after all. To the Young especially, just emancipated from the din and toil of a city-life, a day among green fields is the Revival epoch of the earliest and freshest aspirations, when Nature once more makes us that offer of communion—faint though it be grown with much rejection—which she pressed upon us when we were lads and lasses long ago. Dick's step had an elasticity which it had never felt on the road from Golden Square to the city, although he had already walked five times that distance, and the young blood leaped in his veins like sparkling wine.

Presently, the lane—which was a wide enough road, however—seemed to end abruptly, and to lead to the verge of a blood-red cliff beneath which lay the gleaming sea. Dick had seen blue glimpses of the ocean, here and there, before, for his way had lain along a range of elevated moorland for miles by coach; but this sudden revelation of the great deep, literally at his very feet, almost took his breath away with admiration. He had beheld the Tower of London and St Paul's without experiencing those tremendous sensations which had been expected of him by Mr Mickleham—who had taken him thither when he first came up to town—and had regarded even the commerce-bearing Thames, with its crowded Pool, with considerable equanimity; but the scene now before him affected him to an extreme degree. He sat down upon the lane-side, and taking his knapsack from his back, drank in the gorgeous vision with that thirst which more lads feel for the sights of nature than dare to own it; for even in youth we soon learn to hold it weakness to be subject to impressions produced merely by the works of the Creator, as having little or no practical bearing. The long broken line of gray which marked the opposite coast had indescribable charms for Dick; it might be Wales upon the map perhaps, but to him it was Fairyland. The stately vessels, so far off, that, notwithstanding their white wings, they appeared motionless, were floating mysteries; the steam-ships, whose black pennants trailing through the sky proclaimed their course, outward or homeward bound, had each for him its story.

The hues of earth, and sea, and sky had changed, the noontide insect monotone had ceased, the air came cooler from the stream close by, which ever hurried o'er the cliff to meet the sea, when Dick took up his worldly goods again, and pursued his way once more; for the road did really turn, though almost at right angles, &

few yards short of the precipice, and immediately at the foot of the winding hill lay Salterleigh.

It was a large village, hid in a beautiful ravine, apparently closed up to eastward by a thick wood, amid which could be seen a stream of silver, which was the water-fall for which the spot was famous; southward, however, another hill, as steep as that which Dick was descending, afforded egress, in the strange case of any one wishing to quit so fair a residence; and westward was the one broad street that led to the harbour and the little pier. As the lad neared the high gray bridge which crossed the ravine, and gave access to the town, a mighty red and yellow placard, stuck on a fallen oak-tree, like a vulgar libel on a dead hero's fame, arrested his attention.

#### STUPENDOUS ATTRACTION!!

Monarchs of the Desert and the Prairie!

The only Unicorn now Travelling!!

Largest Collection of Lions, Bengal Tigers, Leopards (striped and spotted), Serpents (inclusive of the so-called fabulous Sea-serpent), Nyghaus (from the Himalyas), 'the Rugged Russian Bear' (Shakspeare), and others too numerous to mention!

QUEEN VICTORIA, PRINCE ALBERT, and the rest of the Royal Family!  
Windsor Castle!

The Lion-tamer of Central Africa!

TICKEROCANDUA the Invincible!

The Earthman and Earthwoman (lowest of created Human Beings) having been engaged by the spirited Proprietary at an immense expense, and for a few weeks only!

Refreshments for the Elephant to be obtained of Doll Jeeheebay, only; formerly Bheestie (Anglic for Keeper of the Menagerie) to his Serene Highness Budgerow Khan!

A high premium given for Birds, Beasts, and Reptiles (N.B. Must be unique).

TREDGOLD'S, late TRIMMING'S, Travelling Caravan.

Come Early.

'That's well,' said Dick to himself; 'and I seem to have hit the place in the very nick of time.' He took out Lucidora's note once more, to make himself quite certain.

'MY DEAR YOUNG SIR—Here is the five-pound note which I forgot to leave when I went to see you at the police-station. I also send, in case of nothing better turning up, a few lines to the head of an old travelling company. A living can at least be picked up in it, although, of course, not a very good one. Mr Tredgold will take you on, I think, for the sake of me and of old times. I would not venture to propose such a thing, but that I hear your uncle means to turn you adrift in the world. I remember how fond, too, you always were of animals. The show is going through Devonshire just now, I see. Bridgewater, 17th (that was last week); Salterleigh, 24th; Barnstaple, 26th; Exeter, 28th. I wish I could help you to anything better, dear lad.—Yours, LUCIDORA.'

Salterleigh is never a very populous town—not even in the fashionable season, for it lies twenty miles from any railway, and the hills which lead thither from all sides are what nervous persons would call precipices—but on the present occasion it seemed to Dick to have been recently devastated by some plague. There was one old man, however, looking out of window in the High Street, horizontally, so as to convey the idea of his being in bed at the same time—who indeed he was—who informed the stranger that everybody was away to see the Beasteses, and that he himself, the speaker, could from his present elevated

position catch a sight of the pictures in front of the principal caravan.

Following the direction of the eyes of this enthusiast, Dick presently came upon the only level spot which Salterleigh could boast of, situated in a romantic hollow of the gorge, usually dedicated to cricket, once a year to the wrestling which formed the principal attraction of the village fair, and on this particular day—unexampled in Salterleigh annals—to the menagerie aforesaid; whose twenty gigantic caravans, arranged in an oblong, and covered over with tarpaulin, presented a material Paradise to so much of the population as could not raise the shilling demanded for admittance. These unhappy persons, some threescore in number, had been standing in front of the gigantic picture and the little flight of steps—that was a Jacob's ladder to them, upon which a more favoured race ascended and descended, from noon to eve—and even now evinced no signs of weariness. Besides the barest possibilities of good-fortune—such as that of some caravan more top-heavy than its fellows falling sideways, and so revealing some hid treasure of natural history; or that more hopeless chance of the vinegar-faced woman, who sat in the shrine upon the platform, beckoning them up into the sacred place gratuitously, out of mere good-nature—there was enough even outside the show to repay any reasonable expectations.

There were, in the first place, to be seen no less than thirteen beef-eaters, and royal beef-eaters too, unless faith is to be denied to golden letters encircling black velvet caps—and in that case, where is Scepticism to cry halt? Each of these persons had some mighty instrument of music, constructed, as it seemed, out of the trunks of golden elephants, cunningly fitting one into the other, and producing in combination a volume of sound which might well be designated imperial quarto. Once every two hours, these gorgeous persons took outside places upon the stage, and discoursed much eloquent wind-music; they were accustomed so to do in thickly populated cities, and were apparently unaware that they had long ago attracted every inhabitant of Salterleigh. Now and then, too, a stout and melancholy-looking gentleman, with a massive watchguard, who was rightly whispered to be the great Tredgold himself, would come to the front, and exclaim, in a sonorous voice: 'Walk up, ladies and gentlemen'—at which the threescore would most passionately cheer—and inspect the greatest wonder of the age. This is the only opportunity which will be afforded in this town, in consequence of the pressure of engagements, and on account of her Majesty Queen Victoria having bespoke the exhibition at Windsor Castle for the 14th of next month.' Then he would converse with the vinegar-faced woman in the shrine, as to the advisability, it was fondly conjectured, of lowering the price of admittance, for it was observed that she always shook her head malevolently, and nothing came of it.

Lastly, there were sounds to be heard, nay, sights to be seen, even by outsiders, in connection with the animals themselves. The camel—or so said the village-schoolmaster's son, who ought to know, if anybody did—was heard to sneeze distinctly, and the elephant—the same authority settled it—to trumpet; although there were certain ignorant and stubborn persons who held this latter noise to be only Mr Tredgold yawning. That gentleman did yawn pretty loudly, it must be confessed, as the evening drew on, and he still beheld the same patient band standing in front of his own, and not 'walking up' with a single shilling. The striped legs of the female hyena had been caught sight of—rather indelicately—by one fortunate outsider through a cranny, which had instantly been stopped up from within on his indiscreetly expressing his gratification; and one of the workhouse-lads protested that he had



beheld the jackal peering round the corner of the platform itself: upon cross-examination, however, this testimony broke down, the witness confessing that he was not prepared to swear it was not a specimen of the *canis communis* after all—the village-clergyman's own dog, which, with a rash reliance upon its master's sacred character, had accompanied him into the show, from which it subsequently emerged howling, and leaving a quarter of an inch of its curly tail in the possession of the racoon.

Dick elbowed his way through this shillingless crowd, whom he sincerely pitied, and ascended the steps amid a tempest of welcome from the band. The vinegar-faced woman smiled acidly upon him from her shrine, as saints both in and out of niches sometimes do, and her skinny hand closed like a snap-purse upon the expected coin. Dick hesitated a moment, doubtful as to whether it would be better to enter as a spectator, and make his observations in that unprejudiced character, or to make known his desire of joining the company at once. Mrs Tredgold, however, upon whose practical mind the lad's dusty clothes and scanty knapsack had in a few seconds made their impression, decided this matter for him by calling out: 'Now, young man, be alive, if you please, and don't pervert the nobility and gentry obtaining access to the exhibition.'

Nature had given to this lady a voice sufficiently shrill, but she generally intensified it by speaking over the edge of a small key, belonging to the cash-box, and held up to her withered lips whenever she was performing her pecuniary duties upon the platform. Her tone did not strike Dick as betokening a propitious frame of mind for welcoming an addition to the staff, and therefore he walked on and into the show without reply.

## CHAPTER XXII.

## A LECTURE UPON NATURAL HISTORY.

The menagerie of Tredgold, late Trimming, was really a fine collection of animals in good condition, and something very different from those melancholy exhibitions made up of a few mangy camels and shuffling elephants, which was all the natural history that travelled in the days of our fathers. There were eight caravans on either side the oblong, and a couple at both ends. Some of these were divided into two, three, or even four compartments; the female Hyena, for instance (whose legs had been so shamefully espied), occupying the ground-floor—which, however, was of course the height of the caravan-wheel from the ground—and the Jackal the floor above; and a rather trying overhead lodger he must have been, in case that lady was nervous; for he spent the whole of his days and most of his nights in pacing to and fro like a sea-captain; and that not only upon the floor of his scanty chamber, but half-way up the walls thereof—either through not being able to stop himself (for he was always in a state of great impetuosity, and as though he had just recollected some very particular appointment which must be kept immediately), or from some other reason known only to Buffon and his own mind. On the second floor resided a Badger of an evil odour, who, being very much ashamed of himself, as he well might be, was always endeavouring to conceal his person from the public eye in a very insufficient quantity of straw. It was a painful position for any animal, aggravated in his particular case by the conduct of a couple of wild-cats in the attics or third floor, who never ceased to express their disapprobation by hissing and pretending to expectorate. On the other hand, the next compartment was what is called in Edinburgh a self-contained house—without flats—the whole of which was in the occupation of a Rhinoceros, whose horn had been exalted in a manner totally unconnected with the Eastern metaphor; for, having moulted or dropped off, or been

knocked off the animal's nose (which retained merely a small knob, as if to mark the locality of the missing ornament), it was hung up on the top bars of his cage, to the wonder of the public, and the distress (as is but too probable) of its original possessor. Mental anxiety of some sort was at all events depicted upon his leathery countenance; while his hide bore unmistakable testimony, in its superfluous folds and excrescences, that it had been made for him to order (unless it was procured at second hand, which seems unlikely) at a period when he was a fatter and more prosperous beast.

By the time Dick's observations had extended thus far, the sagacious elephant Ninus (so called from there having been eight elephants before him under the Tredgold dynasty, of whom two yet remained) rang a mighty bell with his trunk, and the chief exhibitor exhorted the spectators to follow him round the establishment, and listen to his illustrated treatise upon the brute creation. The Salterleigh audience, who had done this five times already—for each of the performances was repeated every hour, with the view of edifying the fresh arrivals that were supposed to be pouring into the exhibition momentarily—obeyed the summons with an alacrity which must have been gratifying indeed, one would have thought, to the feelings of any lecturer; but the gentleman in question, who had sent round his hat after the last four performances with its little appeal to the generosity of the public entirely unresponded to, took up his pole of reference as though it had been a pilgrim's staff, and as if he could willingly have delegated the privilege of dilating upon the affairs of the animal world to anybody else. His quick eye lit upon the only new face among the staring eyes and expanding mouths of his listeners, and to Dick he principally addressed his remarks, as to one who knew how to recompense as well as to appreciate instruction.

'Of all the pursuits calculated to ennoble and refine the human mind, that of the study of natural history, when accompanied by living specimens, it has been agreed upon all hands, is the most advantageous; this is full of wonderful and interesting phenomena—such as what they will touch, and what they will not touch in the way of food, who are their natural enemies, how obedient they are to the eye of man (in this exhibition, entirely unassisted by the whip), and so on, from the gigantic elephant, three beautiful specimens of which are now before us, down to the *ridiculus mus*, or dormouse, so familiar to those around me, and doubtless kept in a lozenge-box, or other warm receptacle, by many of them in their early childhood. Ninus, acquaint this gentleman with the knapsack, who is perhaps an artist, and wishes to take your picture, that you are very glad to see him. What! you won't say a word, my friend! That is very rude. You are glad to see him, I hope, at all events.'

Ninus, being thus invoked, emitted a most awful sound, the reverberation whereof it doubtless was that had so gratified the outdoor spectators, and which Mr Mopes (the exhibitor) explained was the affirmative of the animal—the elephantine 'Yes.'

'And you don't want him to go away again just yet,' continued he, 'not till he has heard the lecture, and seen the Earthman and the Earthwoman, and beheld the Lion-hunt conducted by the Invincible Tickerocandua?'

Ninus being again called upon to reply, and feeling, as many other great personages feel in presence of the public, that he had no observation to make beyond that to which he had already given utterance, repeated the same.

'That is well, Ninus,' observed the exhibitor with hardihood. 'He now says "No," you see; he does not want this young gentleman to go away. Give him a cake, Jeeheebay, and mind (whispered he to the attendant black) it's one of the cayenne-pepper ones;

the aggravating brute!—Cakes and nuts, gentlemen, may be procured, as stated in the bills, of his keeper only, which he will pick up with his trunk, or having opened his mouth at the word of command—'Young man,' observed the lecturer, suddenly interrupting himself, and addressing one of the more youthful of his hearers, 'don't let me see you a-doing that again, or you leave this exhibition directly minute; and I recommend you not to get into the way of that 'ere elephant, neither, any time this ten years. Hoysters indeed! A pretty thing to be offering an hoyster to a poor animal like that, who has not got even fingers to open it. Respect other persons' tastes, sir. How would you like half-a-dozen Abernethies and two quarts of nuts, with their shells on, chucked down your throat, I wonder? And I'm sure you're opening your mouth wide enough anyway.—The elephant, gentlemen and ladies, is sometimes called the whale of *terra firma*; and indeed he can exist for a considerable period under water by means of his trunk, which he elevates above the surface, as in the ordinary diving-bell: when the stream is not deep enough for total immersion, the ingenious animal converts this member into a garden-engine, and cools his body by spouting upon it volumes of water. These animals were made use of by Pyrrhus, king of Epirus, in his wars against the Romans; and that monarch had so high an opinion of their docility and right feeling, that he was on one occasion heard to observe, that it was easier to turn the sun from its course than any of those from the path of honour. The mahout, or elephant-driver, in India is armed with a steel weapon, which, being driven with considerable violence into its neck, the sagacious beast will immediately quicken its pace. Ninus and his two consorts—polygamy being permitted among this gigantic race—will presently go through the singular and interesting performance of standing on their own heads, and placing themselves in other classical attitudes.'

Through the whole of this eulogium, the three elephants kept nodding their heads, as though in the gravest corroboration, and officially presenting their trunks to each of the company (to the manifest perturbation of the Devonshire mind), as though they were touting for some advertising establishment with invisible cards.

'The Nylghau,' observed Mr Mopes, addressing his remarks to the animal so designated, who seemed to have been unable to make up his mind whether he should be an ox or an ass, and to have been punished for the indecision pretty severely by having had the hump of the dromedary clapped upon him—'is one of the most vicious of the natives of India. When meditating an attack, this insidious quadruped will fall upon his knees in a devotional attitude, shuffle on obsequiously a few paces, and then darting forward with a powerful spring, rarely fails to annihilate the astonished spectator.'

'The Camélopard and her young. This quadruped has justly been called the gentlest of animals, as well as being by far the tallest and most useless. The young one before you, which has only been ushered into the world a few days ago, is upwards of nine feet high, without which bountiful provision of nature in respect to altitude he would be unable to partake of that refreshment which his tender age demands. His amble is very peculiar, and may be likened to the knight's move in chess, or the spectacle which might be afforded by a camp-stool in active motion. This creature commonly culls its food from the upper branches of tall trees, thus interfering with the requirements of no other animal; when reduced to crop the herbage of the ground, it has to set its forelegs exceedingly wide apart, in order to bring its mouth sufficiently low; and from that absurd position it surveys the landscape—being gifted with the attribute of looking backwards—from between its

own hind-legs. When erect, it can, on any moderately level ground, observe the approach of an enemy from the other side, or nearly so, of the horizon, and can then make off—though unfortunately only up-hill—at considerable speed.

'The Llama, which is sometimes designated the Camel of the West, in consequence of its being able to go for a lengthened period without water—and, of course, all other liquid refreshments—is good to eat, and also excellent for *paleots* or overcoats. Too easily attracted by curiosity, alas! the hunter has only to lie on his back, with his heels in the air, and these confiding creatures will flock round him, as the boys of our country will surround a street-exhibition; when even the discharge of his fatal weapon is considered (by the survivors) to form a part of the interesting performance. They are extensively used by the Peruvians as beasts of burden; but from the circumstance of their being very weak, excessively slow, and obstinate beyond belief by persons who have been only accustomed to mules, there is little probability of their superseding the horse amongst ourselves. The Llama is a native of South America, but it is occasionally found in Tibet, where it is held in the greatest veneration, and even worship—probably on account of its rarity.'

It was a characteristic of Mr Mopes' lectures, which Dick, of course, did not get acquainted with till afterwards, that on days when the company were numerous, and their donations liberal, his accounts of the animals he described were eulogistic, and even flattering; whereas on unsatisfactory occasions, such as the present, when Mr Mopes' mind was soured by a lack of appreciation, they were detractory and even calumnious.

'The Brown Bear, in common with the rest of his species, has the power of sitting, and even walking, in an erect position, as well as that of climbing trees; but he doesn't do any of it well. It is said that he will not attack a person sleeping; but this, I think, from what I know of him, must mean when the bear is sleeping, and not the man. He is a fierce and remorseless animal, and we keepers, who have to venture into his compartment, risk our lives for a comparatively trifling consideration. Observe his claws, gentlemen and ladies, and how he stuffs his fore-paws into his mouth, as though for want of a human sacrifice. It looks like toothache, but it's nothing of that sort, I do assure you.

'This animal, with the partially shaved countenance, and the inadequate white shirt, is the Guereza Monkey, a native of Africa, the climate of which can alone excuse such insufficiency of clothing. From the bush-like termination of its tail, which commonly forms its cushion, combined with the contemplative expression of its countenance, it is sometimes confused with the fabled Runtumfoozleum, so familiar to many of my hearers as the animal who "sits upon the tip of his tail a-wondering at the ordinances of nature;" but this is not the case.'

Mr Mopes' harangue became wearisome enough to Dick by this time, who, from much acquaintance with the Zoological Gardens, knew almost as much about the subject as did the lecturer; but he was too astute a lad to disgust one who would probably be his future companion, by exhibiting the indifference he really felt. He therefore accompanied him in his tour round the four quarters of the globe, and his researches into earth and sky with laudable attention, laughing only when Mr Mopes laughed, which was seldom, and not during the delivery of his more eloquent passages, where the fun was not so obvious to the narrator as to his hearers—a rule that it is well to observe at lectures of a more scientific character.

The most interesting of all the animals, in Dick's eyes, although those about which Mr Mopes had least

to say, were the lions and tigers, who occupied three contiguous dens—the lions by themselves, the tigers by themselves, and in the third den a lion and a tigress together. What a contrast was there between the appearance of the king of beasts—extended at full length, slumbrous and resigned, but far from torpid, with his calm earnest eyes half open, conscious alike of strength and of captivity—and that of his fellow-prisoner, whose eye seemed to speak fire against every created creature, during that noiseless but impatient pacing to and fro, and whose awful throat to send forth from time to time the very name of the author of her woes, and the object on which her revengeful heart was brooding—Man, Man! With what care, too, despite her wrath, when her rapid stride led her across the lion's extended paws, did she pick her way, cautious not to offend the powerful; and what a murderous sneer she wore at sight of the exhibitor, whose approach she awaited poised upon three legs, a monument of ferocious beauty, as though the hour of her deliverance was at last at hand, and he who was about to confer the benefit should be the first to rue it!

'Did Tickerocandua enter that very cage?' was Dick's inquiry.

'Certainly,' returned Mr Mopes; 'leastways when there was any encouragement afforded by the spectators, he did so. Under present circumstances, which were humiliating to him as a Briton and a believer in the perfectibility of the human race, such a course was out of the question; but even now the Lion-tamer of Central Africa would go through his astounding performances with the three lions and four lionesses in the neighbouring compartment, as advertised in the bills. Whether folks were real gentry, or merely rubbish,' added Mr Mopes with meaning, 'word is always kept with the public in every case.'

'And does the Lion-hunter venture among those tigers?' inquired Dick with interest, and pointing to that far from Happy Family of *Felina* in question, who, ceaselessly winding in and out, and over and under one another, seemed to be treading some terrible tiger-measure to a running accompaniment of snarls and growls.

'Does he go in among them tender-hearted critturs?' echoed Mr Mopes with derisive scorn; 'why, not if he knows it; no.' By which that gentleman did not mean to convey the impression that Tickerocandua ever visited them unconsciously, as in his sleep, but that if he were so rash as to do such a thing at all, the performance would not be repeated.

'The Earthman and the Earthwoman will now make their appearance,' exclaimed the lecturer; and as he spoke, the pair alluded to descended a small ladder leading from one of the two caravans occupied as dwelling-houses, and made their bows to the company. Little akin to humanity as this couple were, they illustrated the poet's statement, that 'Man wants but little here below, nor wants that little long,' by their respective garments, which seemed to be entirely formed of strings of shells, and which, as they moved, made a pleasant tinkling like that of sheep-bells; they could hardly have been put on, however, for a similar purpose, since the wearers were not of a character to become lost or indistinguishable among any amount of their fellow-creatures. The Earthman and the Earthwoman had a certain (perhaps) earthy odour about them, which, independently of the shells, made you aware of their presence at a considerable distance: their hue was an unhealthy brown, relieved by red and yellow spots, wherewith they tattooed themselves precisely as the peripatetic cake-dealers of the humbler sort are wont to sprinkle their gingerbread. Round their waists and arms, they wore German-silver rings of a mighty thickness, which gave them the appearance of having just been released from personal confinement, in order to go through their 'characteristic war-dance;' and the only vocabulary

of which they were possessed consisted, or seemed to do so, of two words—*Woggadaboo*, signifying 'How do you do?' and *Wiggidy*, which was Earthen for 'Thank you, sir.'

It is to be hoped, that as they were unable to speak the English tongue, so were they mercifully debarred from understanding it when spoken by their exhibitor. 'This is the Earthman and the Earthwoman, gentlemen and ladies,' exclaimed Mr Mopes, dexterously insinuating, by emphasis, the immense difference that lay between barbarism and civilisation, 'and it is supposed that they are the lowest of created human beings. It has been conjectured by some, that they are more akin to the orang-outang, or wild man of the woods, whose acquaintance we have just been cultivating, than to the human; but this is easily disproved by the inspection of the toes or fingers; and, moreover, the interesting specimens now before us live where there are no woods, but in holes of the earth, after the manner of the rabbit or cony, and hence their name. The taller one is, of course, the male, who is, however, kept under strict control, and sometimes even beaten by the female, which, again, materially strengthens their position as being allied to the human family. They will perform their characteristic war-dance, accompanied by singing; after which they will go round the company, and wish them "good-bye," by shaking hands, an accomplishment they have been recently taught with infinite pains and trouble: the mode of salutation among themselves—that of rubbing each other's noses briskly together for several seconds—having been found almost ineradicable.'

At the conclusion of this eulogium, the Earthman and Earthwoman began to jump about in their characteristic, but rather alarming manner, at the same time uttering a war-cry compounded of the words *Woggadaboo* and *Wiggidy*; after which they pervaded the spectators, who pressed as eagerly forward for a clasp of their clammy hands as though they were monarchs (which, indeed, they were said to be, in Earthland), and touching for the king's evil.

These ceremonies being ended, and the elephants having duly stood, according to the programme, 'upon their own heads'—which, indeed, if they must needs stand on any, it was quite as well they should have done—and placed themselves in other 'classical attitudes,' Mr Mopes announced that 'the performance would now conclude with the unique exhibition of Tickerocandua the Invincible, in his tremendous character of the Lion-hunter of Central Africa; the only tamer of the Monarch of the Forest now travelling, who could be relied upon with confidence for not having his head bitten off, or other unpleasant accident occurring, which but too often turned, what the public had expected to be a harmless exhibition, into a most distressing spectacle.—It was usual at this stage of the proceedings, for those who were satisfied with the lecturer, to bestow upon him some small pecuniary trifle, the amount of which was left to the ladies and gentlemen themselves.'

At these words, the attention of all Salterleigh became at once engrossed by things which had had no sort of previous interest for them; such as the wood-work and bars of the caravans, the tarpaulin that roofed the exhibition, their clergyman's dog, and, in short, every object which they could admire without laying themselves under an obligation to Mr Mopes; who, on his part, smiled sardonically, and inquired audibly of Dick, as he flipped that young gentleman's sixpence perpendicularly in air, whether he had ever seen such a heap of mean ones out of Devonshire. The question would have been rather an embarrassing one to answer without offence to either party; but luckily, at that moment, Tickerocandua the Invincible was seen descending the ladder of the same caravan which had already sent forth the Earthman and his consort, and Mr Mopes turned upon his heel, with the



air of a monarch who feels indeed that the hour of deposition has arrived, but who, for his part, scorns to bow his regal knee to the coming usurper.

### COTTON COUNTRIES.

It is little to the credit of the magnates of the manufacturing world, that the Cotton Supply Association should have reason to complain that 'the cotton-brokers and mill-owners most directly affected by the short supply of cotton, and most likely to be first benefited by the exertions of the Association, have withheld that measure of support which was naturally expected at their hands.' It is true that whenever the failure of the American crop necessitated short time or closed mills, the voices of the manufacturers were loud enough in appealing to government to encourage the cultivation of cotton in India; but the danger tided over, they quickly relapsed into apathy, and turned away indifferently from those to whom they had cried for help. Such selfish and short-sighted policy is sure to work its own retribution, and in this instance it has done so with little warning. The 'irrepressible conflict' between North and South threatens not only to destroy the great republican confederation, but to bring down heavy punishment on those who have permitted the daily bread of four millions of their countrymen to depend upon the prosperity of the cotton-fields of the United States.

Cotton requires a peculiar combination of heat and moisture, and an even and uniform temperature; extreme dryness impoverishes the plant and stunts its growth, while an excess the other way produces abundance of leaves and very little wool. It is also subject to the attacks of the army-worm, boll-worm, cotton-bug, and chenille, who at times commit great devastation in the plantations. But notwithstanding these obstacles in the way of cultivating cotton with certainty and profit, it will not be difficult to prove that our dependence upon a single source for its supply is as unnecessary as it is dangerous and unwise.

England and France, whose cotton goods are to be found in every known market, grow no cotton at all, although Napoleon the Great once entertained hopes of raising cotton in the latter country. Sicily, Naples, and Malta produce between twenty and forty thousand pounds annually; Sardinia and Spain also yield a small quantity—too small to be worth calculating; and there ends the brief list of the European producers of the raw material, which is the foundation of the most gigantic trade the world has yet seen.

Asia takes more kindly to the great staple. Less than a hundred years ago, 25 per cent. of the cotton imported into England came from Asiatic Turkey, which now sends us some 300,000 pounds—one-twentieth of the quantity it supplied in 1787. This great change is to be accounted for by the great increase in the home consumption, and the demands of the French consumers, who secure nine-tenths of what remains for exportation. In Syria, cotton has been grown for ages; but through careless cultivation, and want of artificial irrigation, the quality of the produce has gradually degenerated, till it has no chance in competition with its rivals in the European markets. The country itself is well adapted for raising cotton. The valley of Basalbec, the banks of the Orontes and Euphrates, and many other districts, abound in extensive tracts of fertile, well-watered land where it might readily be grown, if it were not for the mal-administration of the government, the opposition of the farmers of the state revenue, the apathy of the population, and the want of roads. These difficulties overcome, there is no reason why the cotton of Syria should not compare as advantageously with that of America as its silk does with the produce of Italy and France. The Chinese grow a considerable

quantity of cotton, but not nearly enough for their own use; they look to India for aid—that mine of undeveloped wealth, to which the eyes of Englishmen turn in so many emergencies.

More than two thousand years before European industry was employed in the manufacture of cotton fabrics, a system of spinning, weaving, and dyeing had been brought to maturity in Hindustan. But while the commerce of Europe has expanded so wonderfully in this direction, that of India has remained stationary, or nearly so. The first recorded exportation of Indian cotton to Great Britain took place in 1783, and from that year to 1792, it averaged 65,550 pounds. In 1788, the East India Company were incited to exert themselves in endeavouring to effect some improvement as regarded both the quality and quantity raised; and the exports in 1793 had increased to 729,643 pounds. By 1800, they rose to 6,629,822 pounds. New cleaning-machinery was introduced, and owing to a falling off in the American supplies, the exports of Indian cotton rose for a time to 24,000,000 pounds; after suffering a relapse, they again recovered, and since 1831 have gone on increasing, the average for the years 1851—1856 being 166,981,883 pounds. This, however, gives but a faint idea of the actual quantity of cotton produced in the peninsula. The Chinese trade, taken into account, raises the annual exports to 300,000,000 pounds, while the home-consumption is enormous. Not only is cotton made into clothing, but it is used for beds, pillows, cushions, awnings, canopies, ceilings, curtains, carpets, ropes, halters, and padding of every description—in fact, for every purpose to which we apply hemp or wool. It has been calculated that the native manufacturers thus consume not less than 3,000,000,000 pounds of cotton per annum—a calculation speaking volumes for the productive powers of the country.

These powers have not a fair chance of developing themselves. The want of leasehold, copyhold, or freehold tenures prevents the cultivator feeling any interest in the crop he raises. No person can hold a single acre of land by fee-simple, but is liable to be dispossessed directly he fails to meet all demands of his landlord—the government. These demands, in the shape of land-tax, vary according to circumstances; they amount, on the average, to 20 per cent. of the value of the total yield of the land, but in some cases reach even to 75 per cent., leaving the ryot barely enough for his subsistence. With so little to encourage him, it is no wonder that Indian cotton is so carelessly cultivated and prepared for the market that it cannot compete with the clean staples of America, one-fourth of it consisting of sand, dirt, leaves, and other extraneous matter. When the process called 'cleaning' is going on, the cotton is left exposed to the dews of night, and carefully turned over once or twice, that it may absorb them as freely as possible; the good and bad is then mixed intimately together, and a sprinkling of seed added to each bale. This disgraceful system does not end here, for after the cotton is fairly shipped, the boatmen purloin it, and make up the deficiency in weight by saturating each bale with salt water!

One great difficulty in the way of the cotton culture of India, is the want of water; but the noble rivers afford ample means for a perfect system of irrigation, if the work was undertaken earnestly and energetically. The Mohammedan conquerors of the country have left behind them lasting proofs of the spirit with which they laboured to supply this great desideratum. The East India Company are certainly chargeable with neglect in this matter: till the latter days of their rule, not only were new works not constructed, but even those already existing were suffered to decay. And yet no public works ever proved more profitable to a government. Thirty-nine constructed in the presidency of Madras at an expenditure of

L.54,000 brought an increase in the revenue, amounting to L.415,500; indeed, all such investments fully justified the outlay, the average increase in the production of the soil consequent upon artificial irrigation being at the rate of 300 per cent.

But, supposing all other difficulties removed, before India can take her proper rank as a cotton-producing country, it will be necessary to open fresh communications between the interior and the coast. The only good roads, or at least the majority of them, have been constructed for military purposes, and run north and south, whereas, for commercial purposes, they should run from east to west. The existing roads are up and down hill, and inclined at all angles; one wheel of a vehicle being twelve or eighteen inches higher than the other, or both are buried so deeply in the ruts as scarcely to allow of the axle passing over the main road. Convenient harbours are equally scarce. At Broach, 'the bales are first rolled down the bank to the verge of the mud, into which they sometimes plunge from the impetuosity of their descent. Each bale is placed on the shoulders of six men, who stagger under it up to their waists, or at least their knees, to the boat.' Such, we are assured, is a fair picture of the usual provision for the shipment of the produce of Hindustan. Even in Bombay itself, there is not decent dock accommodation. Unfortunately, the state of the Indian exchequer gives little hope of the government being able to do much for removing these various obstacles to the development of the resources of our magnificent Eastern empire; it remains to be seen whether private capital and enterprise will be encouraged to attempt the task.

At a fortnight's steaming distance from Liverpool, Great Britain possesses the beautiful islands of Jamaica, Barbadoes, Dominica, and their satellites, which in 1786 supplied one-third of the raw material for her cotton manufactures. The famous sea-island cotton is indigenous to the West India Islands, and takes its botanical name (*Gossypium Barbadense*) from one of them. At the commencement of the present century, cotton stood second in importance among the exports of Jamaica, sugar ranking first; and at that time, no less than five different sorts were cultivated there—namely, the Sea-island, Brown-bearded, Nankeen, French, and Brazilian. From 1801, the production declined, till it did not amount to a tenth part of the yield in that year. Misgovernment, protection, and want of enterprise had no little to do with this sad falling off, but the chief cause was the difficulty of obtaining cheap labour after the extinction of slavery. Since that period, the planters have had to depend upon the Creole and Portuguese settlers, and the coolie immigrants. The latter are engaged for five years; and at the expiration of their term, are entitled to a free passage home. By working moderately, they soon become independent, and avail themselves of the terms of the contract to return to India. A body of 315 coolies have been known to take home with them five thousand pounds in hard cash, besides a large amount of wealth in the shape of armlets and rings. The recent treaty with China promises, if some of the colonial restrictions are removed, to provide these fertile isles with the labour so much needed; while the incubus of debt weighing down the planters will soon cease to exercise its malevolent influence, if Jamaica and Barbadoes follow the example of Tobago, St Vincent, and the larger islands, by putting the Encumbered Estates Act into operation. There are no less than six million acres of alluvial soil suitable for the cultivation of cotton in the West Indies and British Guiana; and if a sufficient number of coolies can be induced to bring their labour to the market, we may rest satisfied with the people of Demerara that 'British energy, British capital, and British pluck will accomplish all the rest.'

The French government, duly impressed with the importance of encouraging the planters of Martinique, Guadeloupe, and Guiana, to grow cotton—of which they now produce about three millions of pounds per annum—has not only repealed the import-duty, and offered prizes for the best specimens, but in some instances has even remitted five years' taxation to those engaged in raising the desired staple. Dutch Guiana occasionally sends England a small quantity of Surinam cotton. Cuba is also a producer, but to such a limited extent, that the total amount exported in the three years ending in 1855 only amounted to 187,896 pounds.

The hopes of those interested in 'fresh fields and pastures new' may find encouragement in the reflection, that it is only seventy-six years since seventy-one bags of cotton, shipped from America to England, were seized by the custom-house authorities at Liverpool, on the ground, that that continent could not produce so much! Two kinds are grown in the United States. The upland cotton, which forms the large proportion of the crop, is a short staple, and with such difficulty separated from the seed, that while that operation was performed by hand, the yield was inconsiderable; but after the introduction, in 1793, of Eli Whitney's machine—by which three cwts. were cleansed in a day instead of one pound, as by the old process—the production increased with extraordinary rapidity. The sowing, if the weather be favourable, begins in March or April. The ground is well ploughed, and cast into ridges, along the centre of which the seed is sown in holes from fifteen to eighteen inches apart, several seeds being placed in each hole. In five or six days, the plants appear above ground; and as soon as they can boast the possession of three leaves, undergo thinning—an operation repeated later in the season, when only a single plant is left in each hole, and that is topped for an inch or two, to promote the development of the side branches. Blooming takes place about seventy days after the planting, and the earlier the bloom appears, the larger is the crop, which depends upon the longer or shorter period intervening between the spring and autumn frosts. When the cotton is ripe, it is gathered by women and children; it is then separated from the seed and cleansed, and afterwards packed into bales for the market. Sea-island cotton, the finest imported into England, is raised on the small sandy islands, and along the low shores of South Carolina and Virginia. It is long in the staple, silky in texture, and easily separable by means of rollers driven by horse, water, or steam power. Its growth, however, seems dependent upon the presence of certain saline constituents in the soil and atmosphere, as it only flourishes in the vicinity of the sea; consequently, the supply has for many years been stationary, and forms but a hundredth part of the total crop of cotton raised in the United States.

A hundred and thirty years before the revolution, the English government attempted to force the cultivation of cotton on the planters of Virginia; out of this contest arose the acts which prohibited the receipt or export of any European commodities in other than British-built vessels. In 1786, cotton was raised on the east shores of Chesapeake Bay. The first successful crop of sea-island was grown by Mr Elliot on Hilton Head, Beaufort, in 1790, and fetched 10½d. per pound. In 1806, American cotton was worth from 1s. 3d. to 2s. per pound at Liverpool; in 1820, from 11d. to 1s. 5d.; by 1830, the value had fallen to 7d., and in 1848, actually declined so low as 4½d., since which it has gradually risen; in 1857, the market value being a fraction above 9d. per pound—a price leaving a good margin of profit, the cost to the planter being estimated at 3½d.

The states of Alabama, Georgia, Mississippi, and South Carolina are the greatest producers of cotton, their respective yields averaging twenty-three, twenty,

nineteen, and twelve millions of pounds. Rather more than six millions of acres are under cultivation in the Southern States, engaging one-fourth of the African population. In regard to fertility, the new states naturally rank first, Texas producing 750 pounds of seed-cotton to the acre; Arkansas, 700; Mississippi, 650; Louisiana, 550; Alabama, 525; Georgia, 500; South Carolina, 320; Tennessee, 300; and Florida, 250—each 1000 pounds of seed-cotton producing from four to five hundred pounds of wool.

The proportion of the American crop taken by Great Britain has decreased since 1851 from 58.72 to 46.74 per cent.; the exportation to the north of Europe having increased, while more has been retained for home-consumption, the latter having risen 4 per cent. in the last seven years. Since 1845, indeed, consumption has been gaining ground upon production; and the process of cultivation having apparently reached perfection, while the want of labour prevents the opening up of fresh ground, it seems probable that the production of cotton in the United States has for some time reached its maximum, furnishing an additional reason for the anxiety of those concerned in the manufacture of cotton fabrics.

American planters would fain have the world believe, that there are insuperable difficulties in the way of Brazil becoming a dangerous competitor with Uncle Sam. The English consul at Bahia, however, reports that on the banks of the St Francisco, an unlimited supply of cotton equal to sea-land may be raised, no rain, frost, or blight coming unseasonably to prevent the fruit attaining maturity, or to hinder its being gathered when ripe. The cultivation is neglected, because, from want of roads, the planter has no means of conveying his produce to the coast; but a railway is now being constructed, which will obviate this difficulty. A greater one lies in the paucity of labour, which has caused the production of cotton to retrograde since the suppression of the external slave-trade. In 1858, Brazil exported 18,617,872 pounds to England. Mexico, Peru, New Granada, and the other republics of South America, are well adapted, so far as climate and soil are concerned, for the cultivation of cotton, but the chronic state of anarchy existing in them precludes any hope of their turning their capabilities to any use.

Previous to the year 1820, sufficient cotton was raised in Egypt to suffice for the wants of the native manufacturers; but it was a cotton peculiar to the country, short in staple, of inferior quality, and possessing a strong odour. In the above-named year, a M. Jumel paid a visit to Maho Bey, ex-governor of Dongola and Sennaar, who cultivated various Ethiopic plants in his garden at Cairo. The Frenchman, struck by the appearance of a cotton-tree of a species with which he was unacquainted, drew all the information he could from his unsuspecting host, and with it a packet of seed. M. Jumel's next step was to offer, upon payment of 20,000 dollars, to disclose to Mehemet Ali a method by which he might increase his revenue. The wily pacha agreed, provided the scheme proved successful. Operations were commenced on a small scale at Materceyeh, the first-fruits—three bales—being sent to Europe for approval. The judgment proving favourable, cotton plantations were established throughout Lower Egypt. The fellahs objected strenuously to sacrifice their old crops for the new staple, but the scourge and the stick soon brought them round to acquiesce in the notions of their ruler; and by 1823, the exports of Jumel cotton amounted to 4,393,797 pounds, increased by the succeeding year to 32,472,434 pounds. Although the author of this prosperity had succeeded in his undertaking, he could not succeed in making his employer fulfil his promises, and died bankrupt and broken-hearted. The Jumel, or the Maho cotton, as the ungrateful pacha decreed it should be called, gradually drove the inferior native staple out of cultivation. Several sorts of seed were

introduced into Egypt; the only kind that attained any success was the sea-land, of which 16,000 bales were exported in 1829; after that year, it deteriorated in quality, and has now all but disappeared from the exports of Egypt, in which cotton figures to the extent of 40,000,000 pounds per annum.

Stimulated by Mehemet Ali's success, the French commenced operations in Algeria, principally with the sea-land cotton. In five years' time, nine thousand acres were under culture; but in 1856 and 1857, a great falling off took place, which would have been greater still but for the bounties offered by the government; the experiment as yet has had but a dubious success, and the same may be said of the attempts to induce the people of Tunis and Morocco to try their fortune. Whatever doubt there may be respecting the cotton-producing capabilities of the north of Africa, there can be none whatever as to those of the interior. From latitude sixteen degrees to the equator, cotton has been cultivated from time immemorial. Not only are the inhabitants clothed in fabrics of their own manufacture, but they actually export cloths to the Brazils. Mr Campbell, consul at Lagos, estimated the exports of the Niger states in 1856 to amount to 72,000,000 pounds; but until the last few years, the natives were unacquainted with the best modes of cleaning and preparing the cotton for the European market, and ignorant of the value of the raw material as an export. Through the exertions of Mr Clegg, the chiefs of the various tribes were enlightened on this head, and several young Africans instructed in England in the preparation of the staple. The chiefs are anxious enough to trade, particularly with those white men 'who have hearts for the black men,' and labour is abundant; the African in his own land working willingly ten hours a day for a wage of fourpence. Dr Livingstone was struck with the waste of cotton in Africa, seeing the trees cut down as nuisances in Angola, and growing luxuriantly in the market-places from seed accidentally dropped on the ground. The Angolan women are universally spinsters, going to the fields laden with pots, hoes, and children, but spinning as they go, using the same implements as were in use in ancient Egypt. Roads to the coast are wanted to facilitate the transport of the produce, as everything has now to be carried upon the heads and shoulders of the natives. The slave-hunting king of Dahomey is the great bar to the development of the resources of Africa; however, he shews signs of hearkening to reason, although he refuses to treat with any but the British government. His majesty offers to give up man-hunting, providing a revenue equal to that which he derives from the sale of his victims be secured to him. The British government has not hesitated to declare it is to Africa we must look for cotton; and therefore every effort will doubtless be made by it to open the country and encourage the cultivation.

Cotton of good quality has been produced at Port Natal, but the dislike of the Caffres to labour presents an insuperable bar to making this colony of much service to Manchester. The numerous groups of islands in the Pacific have soils and climates suited for the cultivation; and in the Navigator's Islands, the cotton-plant is perennial, and assumes the form of a tree from two to twelve feet high, bearing bolls of the size of a goose-egg. Australia likewise is a competitor; and some authorities do not hesitate to say that, with a supply of coolie labour, she could send cotton to Liverpool at a cheaper rate than the United States. In the experiments made at Moreton Bay, the yield of seed-cotton was about one thousand pounds per acre, being 25 per cent. above the Texan product; and the rich alluvial soil upon which the experiment was made extends one hundred miles into the interior, and three hundred along the coast.



Whatever may be the result of the dissensions in America, with so many resources open, we ought not to lack as much cotton as our mills can consume.

### LOST!

A PARTING glance round the office, to assure himself all desks, closets, and iron safes are properly secured for the night, and the solicitor's confidential clerk locks up, and prepares for home. With coat buttoned to the throat, and hat drawn over his eyes, Mark Edwards turns his steps towards Islington, and cheerfully faces the rough wind and drizzling rain, which unmercifully pelt and buffet him, as he vainly hails omnibus after omnibus to receive the same answer—'Full.' But Mark makes no trouble of these outdoor inconveniences, for his mind's eye is fixed on the well-covered tea-table, bright fire, and, best of all, the pretty young wife awaiting his return. The picture is so pleasant, that he cheerily breaks forth into a line of *Home, sweet home*, as he turns the corner of the street where stands his own trim little domicile.

Mrs Edwards is peering into the darkness through the folds of the muslin curtains, and has the door open before Mark's hand touches the knocker.

'What a night for you, love!' says the little matron, brushing the rain-drops from his bushy whiskers, and kissing him compassionately; 'and how late you are!'

Edwards looks up at the clock as he struggles out of his dripping coat: 'I am late indeed,' he answers; 'but Mr Pleadwell has started on his trip to the Lakes this afternoon, and there were a great many things to attend to before he went. And look here, Fanny—this packet contains some valuable deeds and securities, which will be called for by the owner in a few days; in the meanwhile, I have to copy one of them, but don't feel inclined to begin to-night. Where can I place them with safety?'

Fanny suggests his desk, but that is the first article a burglar would be likely to meddle with. The wife's cheek pales at the idea of such a visitor, and she considers. 'That old escritoire in the spare bedroom, will not that do?'

Mark still hesitates. 'I had so many injunctions to be careful, and not let them go out of my own possession, that I am afraid of even that.'

Fanny reminds him that there is a secret drawer in it. 'Don't you remember,' she asks, 'what trouble we had to find it?'

'Ha! the very place!' So his wife carries the candle for him, and the valuable packet is deposited in this hidden receptacle. Its only contents are a few highly scented letters, tied together with a piece of ribbon, the which, Fanny laughing and blushing, confesses are Mr Mark Edwards's love effusions before marriage, carefully preserved to bear witness against him when he becomes cold and cross.

Perhaps it was a restless night and unpleasant dreams which made the clerk so uneasy—even in the hurry of the next day's work—knowing that he had not visited the escritoire before leaving home in the morning, to ascertain with his own eyes the safety of the papers in his charge. He pooh-poohs the idea as it presents itself, remembering that *one* key is in his own possession, and the other on his wife's housekeeping bunch; but it returns so often, that it is with a feeling of relief that he hears the signal for closing, and feels he is at liberty to return home.

How is it his welcome is not such a smiling one as it usually is? Fanny's spirits seem depressed, and her eyes look as if they had been clouded with tears.

'Have you had any visitors to-day?' her husband carelessly inquires as he sips his tea.

The hesitating 'No' is so faintly pronounced that

the young man, hitherto preoccupied with business, looks up.

'That "No" sounded like "Yes!" Who has been here?'

'Only my brother George,' Fanny answers in a low voice, and Mark, frowning, turns away, and takes up a book.

'My brother George' is his *aversion*, and the torment and trouble of his wife's family; always in difficulties, no sooner rescued from one scrape than rushing headlong into another, sometimes invisible for months, and suddenly reappearing to levy contributions on any relatives able or willing to assist him. Mark has seriously contemplated forbidding his visits; but then Fanny is so tender-hearted, and cherishes such a kindly belief in the prodigal's ultimate reformation, that her husband has not yet mustered sufficient firmness to enforce his wishes, although he knows where his wife's brooch went, and why she wears that old velvet bonnet. Fanny seems to guess what is passing in his mind by her coming so softly to his side, and stroking his hair, and pressing her lips to his forehead, but neither of them say anything, and Mark leisurely prepares for his task of copying. While he has gone up stairs to fetch his papers, she lights an extra candle, and ensconces herself in a corner with her work-table, regretting as she does so that her 'poor boy' must be bored with this odious writing when he ought to be resting. However, Mark soon comes down the stairs, three at a time, to ask, rather angrily, why she has moved his packet without mentioning it. With astonishment in her looks, his wife denies having done so, and hurries with him to the spare bedroom, asserting her belief that he has overlooked the parcel. Not a thing is out of its place. The old escritoire stands exactly as they left it, the lock had not been tampered with, nor was the secret drawer open; and there, undisturbed, lie the love-letters; but the small brown-paper parcel, tied with pink tape, and sealed with the office seal, is gone!

The husband, suspecting he knows not what, looks almost sternly at his wife, whose answering glance is confused and full of terror.

'Tell me the truth, Fanny, my dear Fanny! Are you playing a trick to tease me? Remember, if I cannot produce these papers, I am a ruined man! It would be worse than the loss of money; that I might replace, these I cannot. Tell me at once where they are.'

'Indeed, Mark, I know no more about them than you do yourself. They must be here; perhaps they have slipped behind the drawer.'

Although next to impossible, the chance is not overlooked; hammer and chisel are soon fetched, and the back of the escritoire is knocked out, leaving no nook or cranny where the smallest paper could remain unperceived.

Almost beside himself, Mark leads his wife down stairs, and commences questioning her. Where is her key? On the ring; it has not been out of her possession. Has she been out? No. Is she quite sure of that? Quite; besides, as she ventures to remind him, the locks have not been forced, nor is aught else missing, as would have been the case if thieves had entered the house. In uncontrollable agitation, the bewildered young man paces the room, while Fanny, unable to proffer advice, or assist him with any reasonable conjecture, watches him in trembling silence.

Suspensions are crowding upon his mind; hints given before his marriage about Fanny Roberts's brother, and regrets uttered, even in his hearing, that a respectable young man like Mr Edwards should lower himself by such a connection, are suddenly remembered and dwelt upon. He pauses before his wife, and sternly demands what errand had brought that brother of hers to his house. That brother of

hers! What a speech! All Fanny's sisterly feelings are in arms, and yet her voice falters, for she is forced to own that it was the want of money. 'And you told him I had those papers in the house,' Mark cries accusingly. With a crimson face, she angrily denies it. She did not mention Mark's affairs during their short interview. Is it likely she would do so? Or if she did, would George, poor foolish fellow that he is, steal up stairs and rob his sister's home? Ridiculous! Impossible!

'Impossible,' Mark retorts, 'without he possessed the key.'

'It has not been out of my pocket,' sobs Fanny.

'Then where,' asks Mark, 'are the missing papers?' Their little servant-maid away for a holiday—no one in the house, according to Fanny's own confession, but this young man. Where are the papers?

Receiving for reply a torrent of tears and protestations, he flings himself on the sofa, and tries to steady his nerves to the consequences of this extraordinary loss. Meanwhile, Fanny goes and institutes an unavailing search in every box, and cupboard, and drawer where it could be possible to find such a parcel, although it would puzzle her to explain how it could have withdrawn itself from the secret drawer to take refuge elsewhere. At last she returns to the parlour in despair. The packet must have been stolen. But how? When? By whom? Getting frightened at Mark's gloomy looks, she is delighted when a tap at the door announces a visitor, and that visitor proves to be her father.

To him the mysterious affair is circumstantially detailed, and Mark points out the inevitable loss of his situation and good name if he should be unable to produce the papers, or give any clue which might lead to their recovery. To Fanny's dismay, he particularly dwells upon her brother's visit, and her half-made endeavour to conceal it; concluding by an entreaty that she will, if retaining any affection for her husband, tell all she knows.

But now the father interposes. To tamely hear both his children accused of such a crime, is more than his rather irascible temper will endure, and he enters a counter-accusation that Mark has, for some unworthy end, removed the parcel himself. Words now become so hot and bitter that Fanny's distress is increased, not lessened by this championship, and she weeps so bitterly, and pleads so earnestly with both, that Mark, more touched than he would like to confess, abruptly leaves them to shut himself in his chamber. After some hours, the sound of his footsteps ceasing, the anxious wife creeps softly up the stairs, and is relieved to find him lying on the bed in an uneasy slumber. Her father persuades her to rest too, but poor Fanny shakes her head, and still sits by his side, leaning her head on his shoulder, and feeling more forlorn and miserable than it had ever been her lot to feel before. What will poor Mark do? And what will become of her, if he persists in believing her guilty?

Equally bewildered, and almost as unhappy as his daughter, Mr Roberts tries to soothe her with promises, not only to seek George, and bring him to exculpate himself, but to forgive Mark's hasty speeches, and assist him in investigating this mysterious affair. So, at last, Fanny begins to feel more comforted, and to wish her father to leave her; but, tired as he confesses himself, he cannot quit her in such trouble, and they continue to occupy the same position by the fire till night has long given place to morning, and Mr Roberts's eyes close involuntarily.

A footstep overhead startles them. 'It is only Mark,' says Fanny after a moment's listening. 'Poor fellow, I wish he had slept longer.'

In the modern six-roomed house every sound is distinctly audible, and they hear him enter the chamber where stands the now shattered escrutoire. After a short pause, he is heard slowly descending the

stairs, and his wife raises herself from her reclining position, and smoothes her disordered hair.

As he enters the room, Mr Roberts lays his hand on his daughter's arm. 'Look, child, look!' he whispers; and Fanny sees with astonishment that her husband is fast asleep, and holds in one hand the bundle of old love-letters.

Setting down his candle, Mark unlocks the front of his large and well-filled bookcase, and begins deliberately taking down, one by one, the handsomely bound volumes of the *History of England*, which grace the highest shelf; then he draws out a number of loose magazines, hidden there because of their untidy appearance; lays the old love-letters quite at the back of all, replaces the odd numbers, returns the volumes to their shelf, carefully putting them even, locks the glass-doors, and is stalking away, when Fanny, with a cry which awakens him, snatches the key from his hand. Rubbing his eyes, and wondering, he sees her eager fingers dragging Hume and Smollett from their proud position to assume an inglorious one on the hearth-rug and in the fender; the once treasured *Belle Assemblées* are scattered in all directions; the highly prized love-letters receive similar usage; and then, from behind all the rest, Fanny triumphantly takes out the small brown-paper parcel, tied with pink tape, and sealed with the office seal. Crying and laughing in one breath, the happy little wife is the next moment in her husband's arms, kissing and being kissed *ad libitum*.

Little explanation was needed. The young man's brain, excited by extreme anxiety regarding his trust, had led to his cautiously rising in the night, and unconsciously transferring the packet to what he afterwards remembered as the first hiding-place which had presented itself to his mind on bringing it home the preceding evening.

How many times he has asked forgiveness is not recorded, but Fanny is a true woman, quick to resent, but easily appeased; and Mark has taken George and George's affairs in hand so heartily, that the young scapegrace is actually improving, and there is even some hope of Fanny's belief in his total reformation being realised.

#### BITTERNESS.

We sat among the ripe wheat sheaves;  
The western skies were golden red:  
We had a book; we turned the leaves;  
But not a word we said.

A sudden lull; a thrilling pause;  
We seemed at once one thought to have.  
We little could divine the cause  
That such a moment gave.

A minute that comes once and goes;  
That must be snatched at once or lost:  
O foolish heart!—but something rose  
In me. Our Fate was crossed.

We rose up from the shining sheaf;  
We looked back at the setting sun;  
We scarcely spoke; we seemed to grieve  
The golden day was done.

And on the morrow I was gone,  
Who could not speak for paltry fear.  
The morrows will go gliding on,  
And we find each a bitter one,  
Nor meet for many a year.

T. A.

Printed and Published by W. & R. CHAMBERS, 47 Paternoster Row, LONDON, and 339 High Street, EDINBURGH. Also sold by WILLIAM ROBERTSON, 23 Upper Sackville Street, DUBLIN, and all Booksellers.